

# The Climate Change Challenge

## The Role of Land Professionals

**Prof. Stig Enemark**


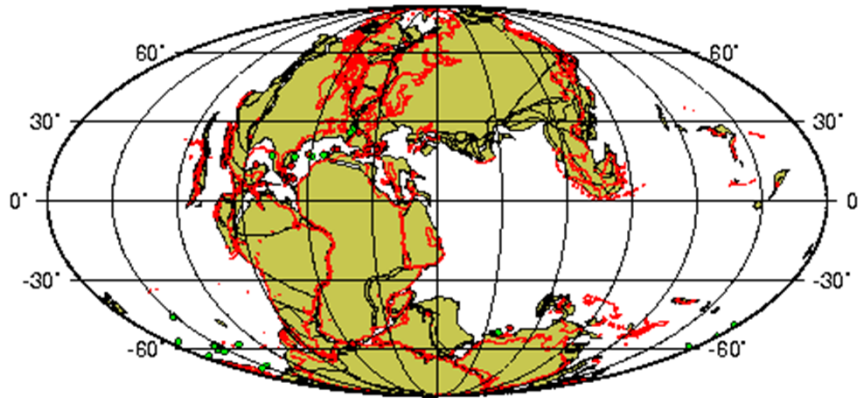
Past  President 2007-2011  
Aalborg University, Denmark

FIG WORKING WEEK, MARRAKECH, MOROCCO, 18-22 MAY 2011

## The Climate Change Challenge – Outline...

- **Stating the Challenge**
  - Climate change is a fact...with serious impact
  - The Global agenda
- **Addressing the Challenge**
  - Politically – Professionally – Personally
  - Mitigation – Adaptation – Integration
- **Engaging in the Challenge**
  - Land Professionals should take a lead role...

## Climate Change ...A historical perspective



150 My Reconstruction

Source: Ze'ev B. Begin, Eilat, 2009

***We cannot change the Hazard  
but we can manage the Risk***

## Climate change is a fact...

**YOU CONTROL  
CLIMATE CHANGE.**



Climate change is a fact  
- but it is not new...

What is new is..... that it is  
enforced by humanity

Global warming  
Drought  
Environmental  
degradation



A range of impacts  
and indicators



Sea level rise  
Flooding  
Natural disasters

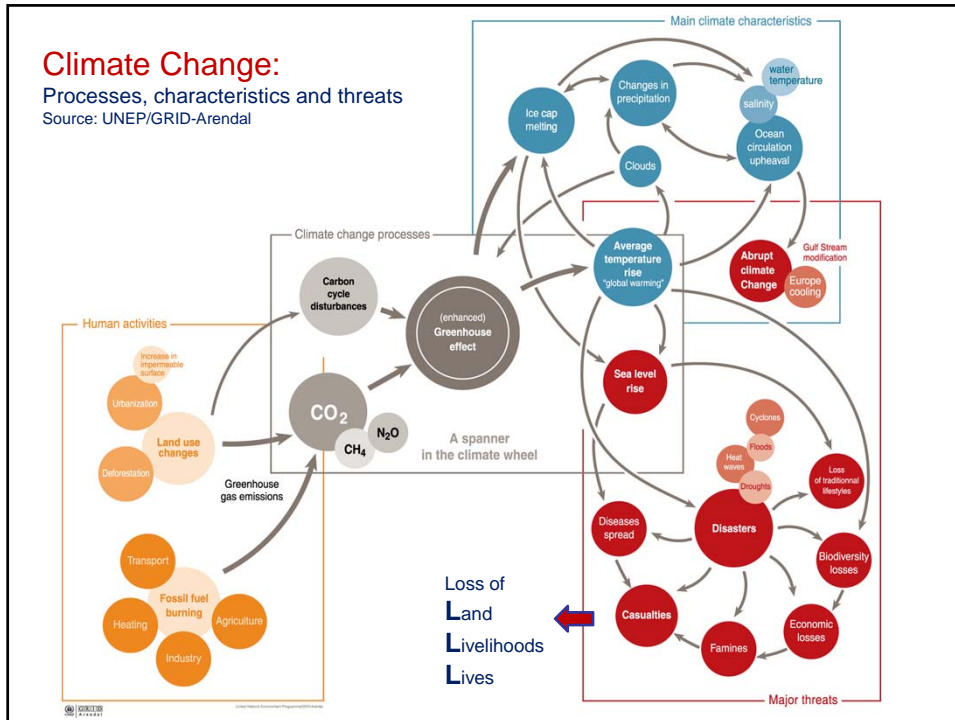


Climate change will affect the basic elements of life for people round the world – access to water, food production, health and the environment.

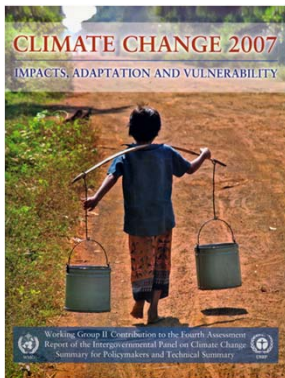
(UN-Habitat 2009)

**Climate Change:**  
Processes, characteristics and threats

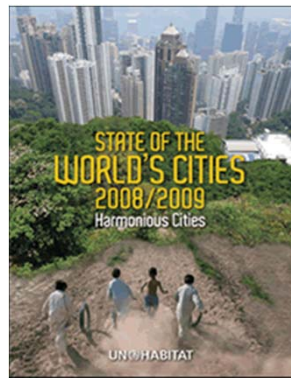
Source: UNEP/GRID-Arendal



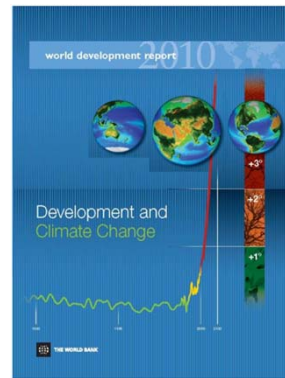
## Climate change – Key publications



Intergovernmental Panel on Climate Change, 2007



UN-HABITAT 2008



World Bank, 2010

United Nations Framework Convention on Climate Change  
Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries (UNFCCC, 2007)

## Climate change impacts

Themes: Freshwater resources  
Ecosystems  
Food and forests  
Coastal areas  
Industry and society  
Health

Likely Scenarios if Climate Change Continues

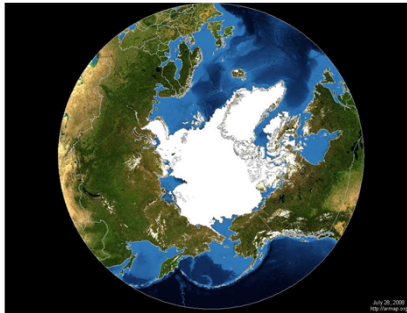
SELECT CLIMATE IMPACTS



Based on IPCC, Climate Change 2007.

<http://environment.nationalgeographic.com/environment/global-warming/gw-impacts-interactive.html>

## Global warming impact – the Arctic joker...



IPCC, 2007 talks about a sea level rise of 0.20 – 0.60 metres in the year 2100 mainly through thermal expansion of the oceans.

However, the Arctic ice seems to be melting faster...

Recent research predicts a sea level rise of 0.9 – 1.6 metres in 2100 (State of the Arctic Coast, 2010).



Today about 150 million people live in areas less than 1 meter above sea level.

## Global warming impact – ice melting



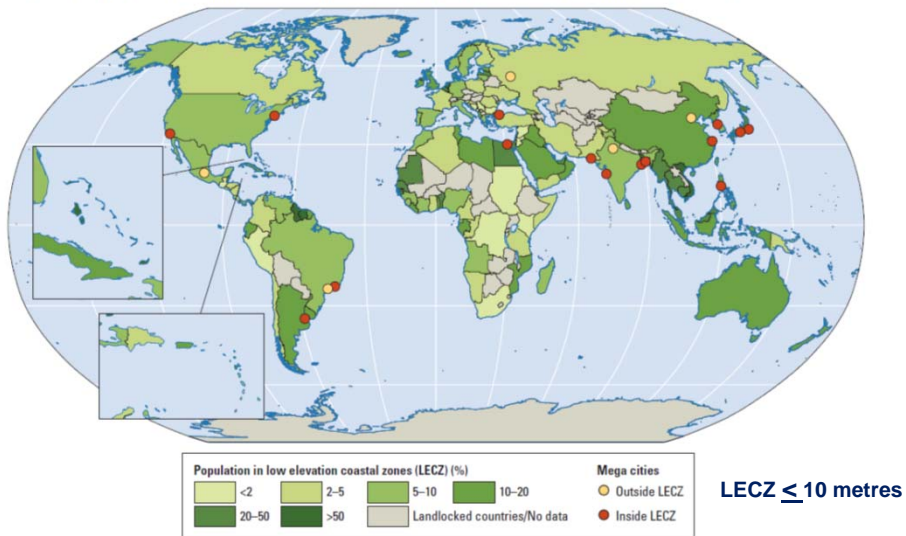
Himalaya

Glacier lake burst risks:  
Huge flooding and drought



## Global warming impact – sea level rise...

Map 2.1 At risk: Population and megacities concentrate in low-elevation coastal zones threatened by sea level rise and storm surges

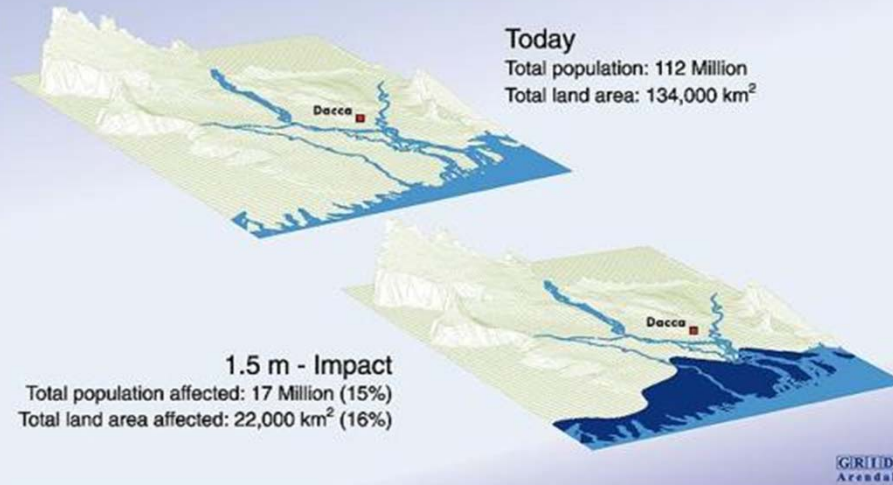


Source: United Nations 2008a.

Note: Megacities in 2007 included Beijing, Bombay, Buenos Aires, Cairo, Calcutta, Dhaka, Istanbul, Karachi, Los Angeles, Manila, Mexico City, Moscow, New Delhi, New York, Osaka, Rio de Janeiro, São Paulo, Seoul, Shanghai, and Tokyo. Megacities are defined as urban areas with more than 10 million inhabitants.

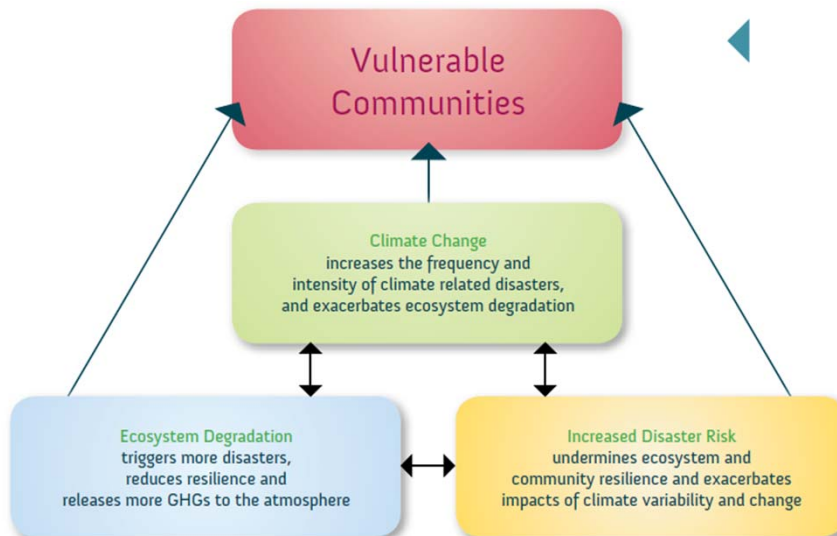
## Climate Change Impact

### Potential impact of sea-level rise on Bangladesh



Source: UNEP/GRID Geneva; University of Daoga; JRC Munich; The World Bank; World Resources Institute, Washington D.C.

## Ecosystem Degradation and Disaster Risk



The interaction between climate change, ecosystem degradation and disaster risk, UNEP, 2009

## Decreased Community Resilience



Drought  
Food shortage

Environmental  
degradation



## Statement on the Climate Change Challenge



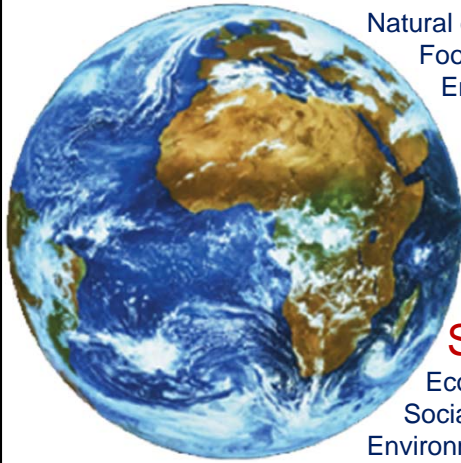
**“Climate change is the defining challenge of our time”**

Combining the impacts of climate change with the current global financial crisis we risk that all the efforts to meet the MDGs will be rolled back.

Those that contributed the least to this planetary problem continue to be disproportionately at risk.

**Ban Ki-moon, SG, United Nations, 2009**

# The Global Agenda



## Climate Change 2010's

- Natural disasters
- Food shortage
- Environmental degradation

## MDGs 2000's

- Poverty alleviation
- Human health, education
- Global partnership

## Sustainable Development 1990's

- Economic
- Social
- Environmental

# The Millennium Development Goals Report



8 Goals  
18 Targets  
48 Indicators

2010

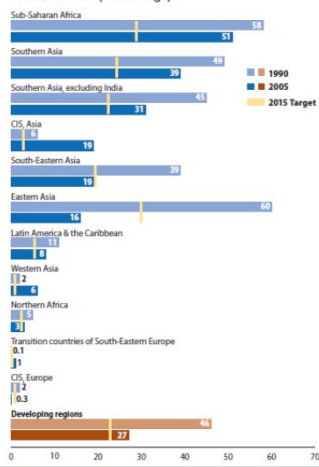


## Goal 1, target 1:

**TARGET**  
Halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day

The global economic crisis has slowed progress, but the world is still on track to meet the poverty reduction target

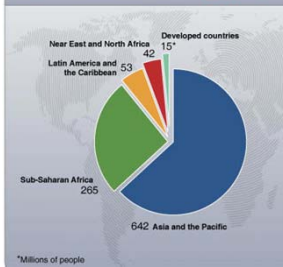
Proportion of people living on less than \$1.25 a day, 1990 and 2005 (Percentage)





## Food shortage – large scale agri-business

More than 1.02 billion hungry people



One sixth of humanity undernourished



Climate Change and Food Production, FAO 2008.

## Urban Growth – sustainable cities

	1950	1975	2007	2025	2050
World Urban Population (million)	737	1,518	3,294	4,584	6,398
Percentage	29.1%	37.3%	49.4%	57.2%	69.6%
More Developed Region (million)	427	702	916	995	1,071
Less Developed Region (million)	310	817	2,382	3,590	5,327

Source: World Urbanization prospects, UN, 2008



Close to 1 billion people, or 32 per cent of the world's urban population, live in slums in inequitable and life-threatening conditions, and are directly affected by both environmental disasters and social crises, whose frequency and impacts have increased significantly during the last few decades.

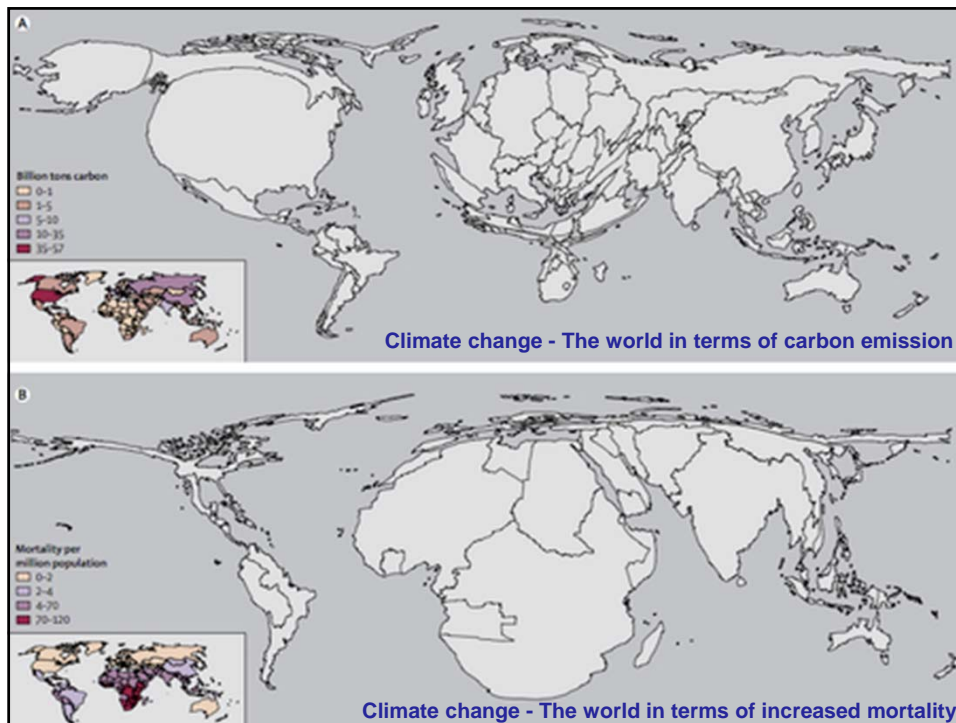
Planning Sustainable Cities  
UN-Habitat, 2009

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## Addressing the Challenge

- **Political**
  - Global bargaining about CO2 emission – COP15, 16, 17...
  - Mitigation – national policies for reducing emission etc.
- **Professional**
  - Advocating the global agenda
  - Monitoring through scientific measurements
  - Adaptation through means of land-use planning and control
- **Personal**
  - Conducting your consumer life and behaviour to meet the challenge



## Addressing the Challenge

No matter the inequity in terms of emissions and climate change consequences..... there is a need to develop relevant means of adaptation to climate change in both the rich and the poorer countries.

**Poverty reduction is - in itself - a means of adaptation to climate change**

**Sustainable and integrated land-use management is another means**

## Statement on the Climate Change Challenge



“Climate change also provides a range of opportunities”

Prevention of climate change can be greatly enhanced through better land-use planning and building codes so that cities keep their ecological footprints to a minimum and make sure that their residents, especially the poorest, are protected as best as possible against disaster.

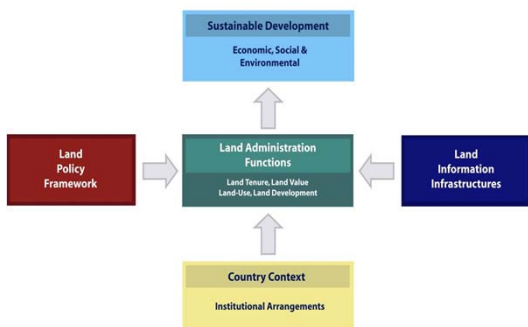
Anna Tibaijuka, Past ED, UN-Habitat, 2009

## Adaptation strategies

Sector	Adaptation Strategy	Policy
<b>Water Supply/ water hazard</b>	Water supply, storage, reuse, recycling; Public participation i flood risk programs; Control of use of groundwater,;	Integrated water resource management; Water related hazard management
<b>Infrastructure/ settlement</b>	Replacement of drainage and sewer system; Redesigning seawalls, dunes; Land acquisition for wetlands as buffer zones	Design standards, codes, regulations; Integrate climate change into land use policies;
<b>Human health</b>	Emergency medical services; Climate sensitive disease control; Access to safe water and sanitation;	Strengthen health services; Integrate climate risk into public health policies;
<b>Urban transport</b>	Environmental friendly transport system; Efficient public transport; energy efficient cars; New design of road systems	Investment in research; Integrate climate change into urban transport policies
<b>Energy</b>	Strengthening of transmission lines; Underground cabling for utilities; Increasing energy efficiency; Renewable resources	Sustainable energy policies; Integrate climate change into green energy policies.

Adapted from: State of the Worlds Cities 2008/2009, UN-Habitat, 2008

## The Land Management Paradigm



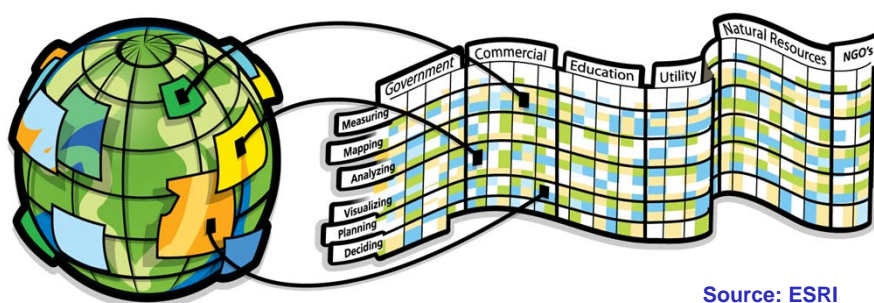
Land governance is about the policies, processes and institutions by which land, property and natural resources are managed.

This includes decisions on access to land; land tenure; land value; land use; and land development.

**Land Administration and management is a key means of climate change adaptation**

## Land Information....Geo-information

...creates a strong foundation



Source: ESRI

**...for sustainable action**

## Land Governance and Climate Change

Sustainable **Land Administration Systems** should serve as a basis for climate change mitigation and adaptation as well as prevention and management of natural disasters.

Incorporating climate change into current land policies
Adopting standards for energy use, emissions, carbon stock potential,...
Identifying prone areas (sea level rise, drought, flooding, fires,...)
Controlling the use of land in relation to climate change and disaster risks
Introducing carbon footprint assessments in relation to land use developments
Controlling building standards and emissions in relation to climate change
Improving resilience of existing ecosystems vulnerable to climate change

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## The Climate Change Challenge

“Our generation’s response to this challenge  
will be judged by history”

Barrack Obama to UN 2009 on Climate Change

This is the time for you to get engaged  
- and make a difference

## The role of the land professionals

Engaging in the global agenda will require multidisciplinary skills:

- **Technical**  
Geodesy models, mapping, surveying  
Spatial data infrastructures
- **Managerial**  
Land tenure, land value, land-use and land development  
Transparency and good governance
- **Advocacy and leadership**  
Interact with politicians, NGOs and civil society

## The Role of the Land Professionals

Is to....

- **Take a lead....**
  - Understanding and advocating the global agenda
  - As land professionals: "This is something that we can do something about"
- **Monitor change**
  - Global positioning infrastructures and warning systems
  - Data interpretation and presentation
- **Implement adaptation**
  - Integrated land administration and land-use management
  - Disaster risk management systems

New **FIG** Task Force on Surveyors and Climate Change

## Facing the Global Agenda



Good Land Information and Good Land Governance is fundamental for

- Coping with Climate Change
- Meeting the Millennium Development Goals, and
- Achieving Sustainable Development



## Key Message

The linkage between climate change adaptation, poverty alleviation, and sustainable development should be self evident  
- but the linkage is not well understood by the public in general.

Land Professionals are custodians of enabling technologies and practices, and should take a lead role in:

- Explaining this linkage to the wider public, and
- Facilitating action

*“Development needs to be climate ready, even if it cannot be climate proof”*

The Economist, The World 2011

**Thank you  
for your attention**

